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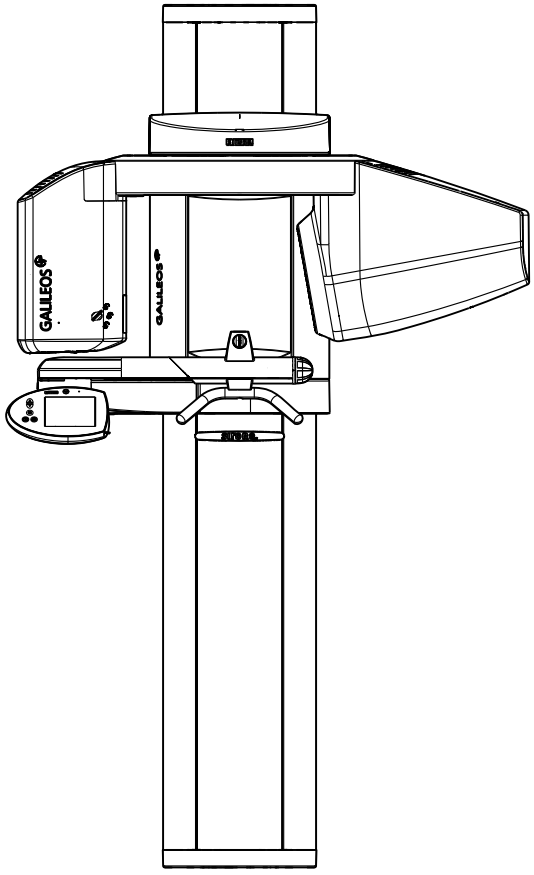
sirona
The Dental Company

GALILEOS

Maintenance Instructions GALILEOS Comfort PLUS

English



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1 Safety

NOTICE

Qualifications of service personnel

Installation and startup may be carried out only by personnel specifically authorized by Sirona.

⚠ WARNING

Perilous shock hazard!

You must switch off the unit and then wait at least 1 minute, for measurements at the tube assembly at least 4 minutes, before you start to connect test cables or remove a cover!
For measurements in the area of the power supply terminal, the unit must be disconnected from the junction box of the building installation before you start to connect test cables!

⚠ DANGER

X-rays

When performing the following tests, be sure to observe the radiation protection regulations applicable in your country (see Operating Instructions).

⚠ DANGER

X-rays

"Radiation" is signaled by the message "X-RAY active!", a beep, and an X-ray LED.

NOTICE

Risk of damage to boards

Please observe the usual precautionary measures for handling printed circuit boards (ESD). Touch a ground point to discharge static electricity before touching any boards.

IMPORTANT

It is essential that you also observe the notes about the operation of the unit in the Operating Instructions.

2 Operation notes

Nominal line voltage

The volume tomograph operates in the following nominal line voltage ranges:

- 200 – 240 V
- 50 / 60 Hz

The permissible line voltage fluctuation is ±10%.

The internal line impedance must not exceed 0.8 Ω.

Only permanent electrical connection of the unit is allowed.

IMPORTANT
The regulation "Federal Performance Standard for Diagnostic X-ray Units, Code of Federal Regulations, Title 21 CFR, Subchapter J" requires a corresponding power supply connection.

Cooling period

The cooling period between two exposures is maintained by an automatic exposure blocking function according to the pulse/pause ratio (see Operating Instructions). The decrementing waiting time count is displayed on the control panel.

Measurements

Always switch the unit off before connecting a measuring instrument.

For safety reasons, the power supply should be switched off at the junction box of the building installation when performing measurements in the vicinity of the power supply unit.

Select the correct current/voltage type and adjust the measuring range to match the expected readings.

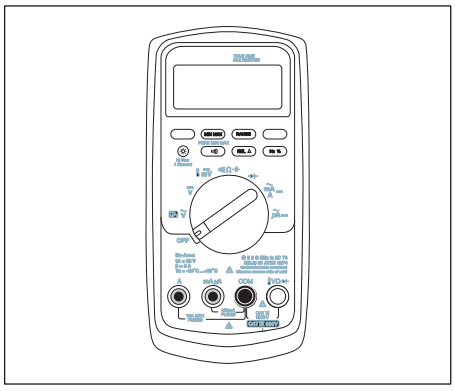
Perform continuity tests only on units which are switched off.

If several exposures with radiation must be taken to check a measurement, make sure that the prescribed cool-down intervals are observed. They are maintained by an automatic exposure blocking function (see Operating Instructions).

The pulse/pause ratio is 1:20, i.e. a 20-second pause is maintained for each second of radiation cycle. The pulse/pause ratio is automatically maintained (automatic exposure blocking).

It is essential that you observe the radiation protection regulations applicable in your country prior to radiation release.

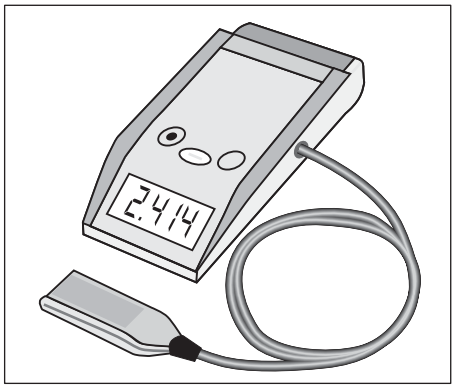
3 Auxiliary devices required



⚠ CAUTION

Only use a battery-operated digital multimeter with safety sockets.
It is essential that you observe the safety and operating notes provided in the operating instructions of the multimeter.

- Battery-operated digital multimeter of type:
  - Fluke 8000 A
  - Philips PM 2816 rms
  - or similar



⚠ CAUTION

It is essential that you observe the safety and operating notes provided in the operating instructions of the dosimeter.

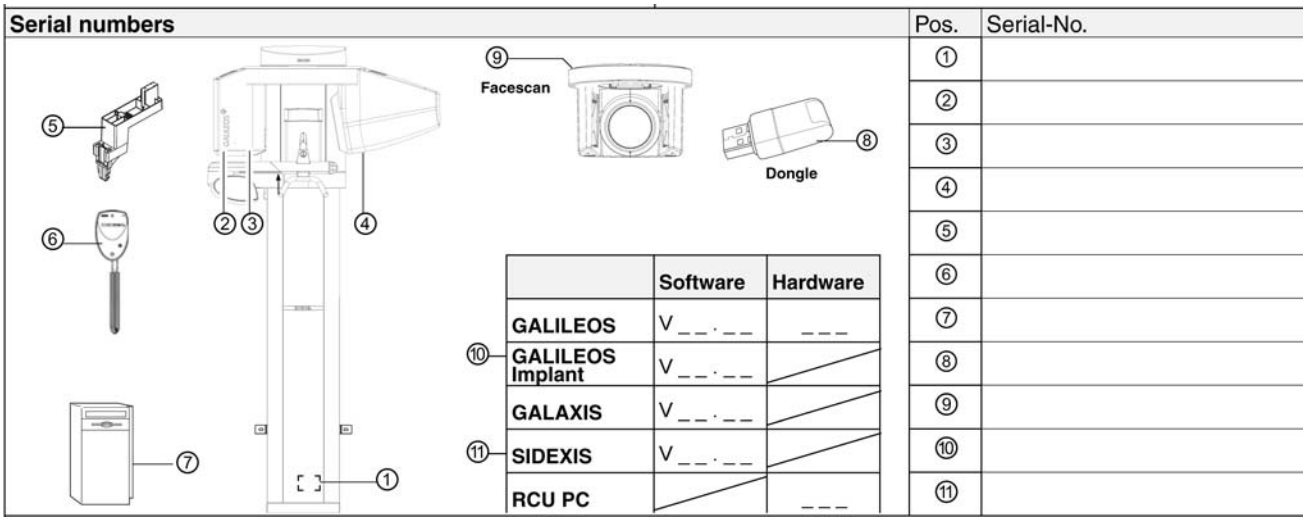
- Dosimeter for pulsed radiation of type:
  - Mult-O-Meter 512L
  - or similar

⚠ CAUTION

Use exclusively fully insulated measuring wires.
Check the measuring wires for damages before use.

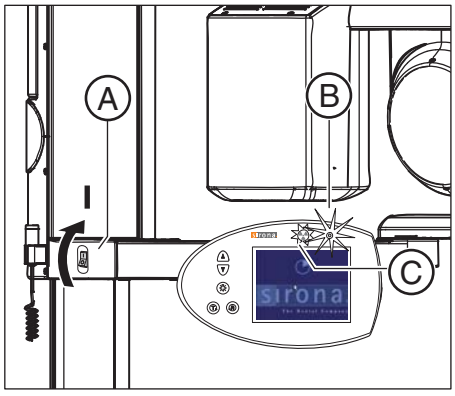
- Measuring wires with the following properties:
  - dielectric strength > 1000V

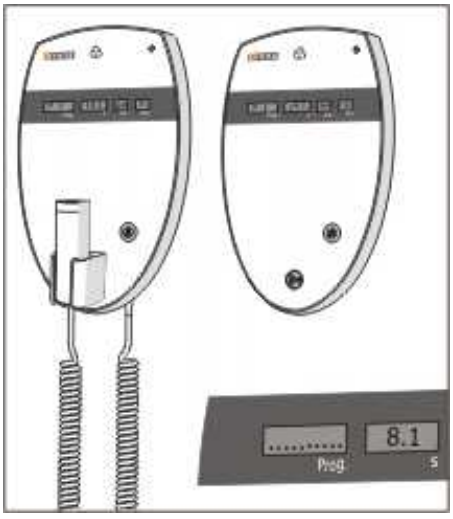
4 Visual check



- Check for mechanical damage that could affect radiation protection.
- Check that all labels are attached and legible.
  - Damaged/imperfect labels must be replaced.
    You can order them in writing from Sirona (see back page for address),
    stating the following:
  - Customer's name
  - Customer's address
- Check to see whether all model numbers with serial numbers are attached and are still legible on the device for the purpose of identification.
  For serial numbers see also Installation Report / Warranty Passport.

5 Optical and acoustic signals





1. Turn the main switch **(A)** to position I.
   - The X-Ray radiation indicator **C** lights up briefly.
   - After approx. 2 seconds, the green LED **B** in the upper part of the control panel lights up. This LED remains lit as long as the unit is on.
   - The start screen appears on the touchscreen of the Easypad and the initialization of the device starts running (for approx. 1 minute). The rotating element rotates briefly clockwise and counterclockwise.
2. Check the function of the keys.
   - Press a height-adjustment key. The movement of the height-adjustment motor is accompanied by an acoustic signal.
   - If Remote has been installed, test the buttons and the display of the remote unit, too.
   - The release button must not be defective or damaged.

See also the Operating Instructions, in the Operation section.

5.1 Checking the function of keys and buttons

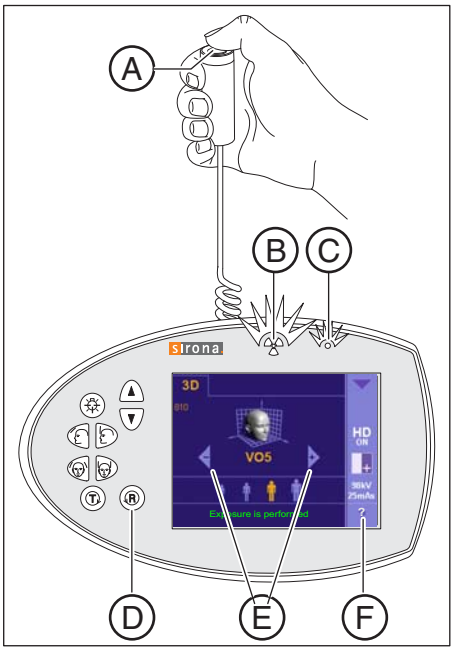
⚠ WARNING

The unit emits X-ray radiation.

Excess exposure to X-rays is detrimental to health.

➢ Use the prescribed accessories for radiation protection.

➢ Do not stay in the X-ray room during exposure. Move as far away from the unit as the coiled cable for the release button allows you to.



✓ "Unit ON" LED display **C** lights up. Press the R key **D** to move the unit back to the starting position. As long as no connection has been made to SIDEXIS XG, the message is displayed in the comment line of the control panel on the *"Switch SIDEXIS to ready for exposure state"* touchscreen.

1. Switch on the PC.
2. Start SIDEXIS XG.
   For further information and possible error messages, see Operating Instructions.
3. Use the -/+ keys to select a program **E**.
4. In the sub menu **F**, select a kV/mA combination with the -/+ keys.
5. Check whether the patient symbols on the touchscreen can be selected in exactly the right position.
   If problems occur during selection, adjust the touchscreen ().
6. Press release button **(A)** and hold it down until the end of the exposure.
   ↳ The exposure is released. *"Exposure is performed"* appears in the comment line on the touchscreen.
   During radiation, the optical radiation indicator **(B)** lights up on the Easypad; during radiation, an acoustic signal is also emitted.
   Radiation can be triggered multiple times during exposure.
   When the rotation and radiation switch off automatically, the exposure is complete.
7. Let go of release button **(A)**.
   ↳ The exposure is completed.

8. **Cancel exposure - Check deadman function**
   Select the same exposure parameters.
   The operational readiness LED B flashes until the automatic cooling-off period of the X-ray tube assembly has expired (automatic exposure block).
9. Press the release button **A**.
10. Let go of the exposure release button.
    ↳ The exposure is immediately terminated.
    The confirmation of the exposure data is displayed on the touchscreen. The radiation time and the area dose product (the lower two values) flash. In this way, an exposure that has been triggered can be canceled again at any time.

⚠ CAUTION

Defective indicators and keys represent a risk to the safety of both the patient and the operator.

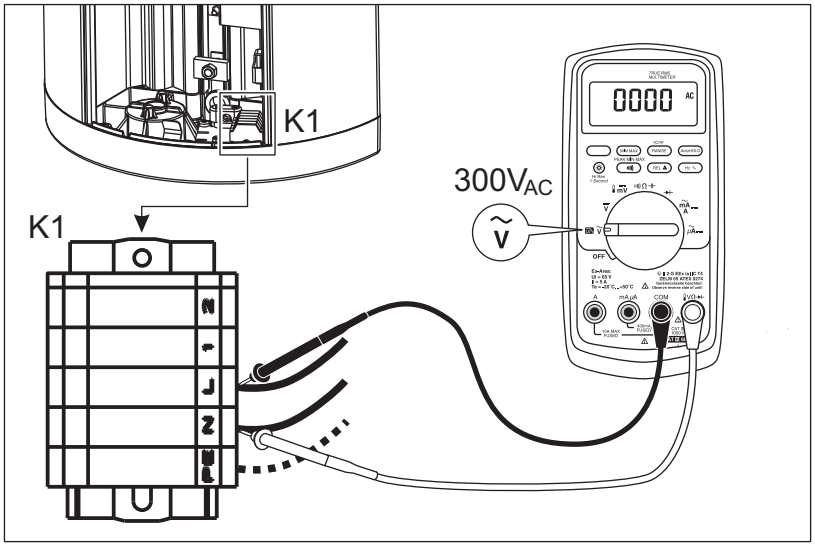
The user is not permitted to operate the unit until the necessary repairs have been made.

6 Checking the power supply connection

To check the line voltage, the *line voltage drop* must be determined while creating an X-ray. To do this, proceed as follows:

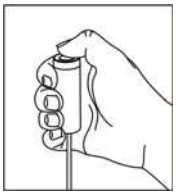
Preparing the measurement

1. **DANGER! After disconnecting the unit from the junction box of the building installation, wait at least 1 minute before starting to check the line voltage!**
   Disconnect the unit from the junction box of the building installation.
2. Remove the "Bottom profile" cover (see Service Manual).



3. **CAUTION! Only use fully insulated measuring wires.**
   Connect the measuring wires as shown in the illustration to the connectors **L** and **N** of the power supply terminal **K1**.
4. On the multimeter, select the voltage measuring range "300 V_{AC}".
5. Re-attach the unit to the junction box of the building installation.
6. **DANGER! Do not touch any live components!**
   Set the main switch (**A**) to **I** (see also Operating Instructions).
7. Wait for approx. 1 minute.
8. Press the R key.
   ↳ The unit moves to its starting position.

Performing and analyzing a measurement



1. Set the highest kV/mA level, e.g. **98kV/12mAs** (see Operating Instructions).
2. Make the SIDEXIS XG ready for exposure.
3. **CAUTION! Activating the release button triggers X-rays.**
   Activate the release button and take the voltage drop reading on the multimeter display.
   - If the measured voltage drop does *not fall within the permissible tolerance range* (see the following table), notify the customer that a suitable line voltage (according to the notes listed in the Installation Requirements) must be installed.

IMPORTANT
In such a case, the unit must be switched off immediately and disconnected from the junction box of the building installation. It must not be placed in operation!

   - If the measured voltage drop falls within the permissible tolerance range (see the following table), finalize the measurement.

Permissible voltage drop:

Line voltage, with zero load	Max. permissible line voltage drop
180-208 V	9 V
208-230 V	8 V
230-240 V	7.5 V
240-264 V	7 V

Concluding the measurement

1. Switch the unit on via switch (**A**) (see also Operating Instructions).
2. Disconnect the unit from the junction box of the building installation.
3. **DANGER! Wait at least 1 minute after disconnecting the unit from the junction box of the building installation before removing the measuring wires!**
   Remove the measuring units from the unit.
4. Re-attach the "Bottom profile" cover to the unit.

7 Checking the tube current

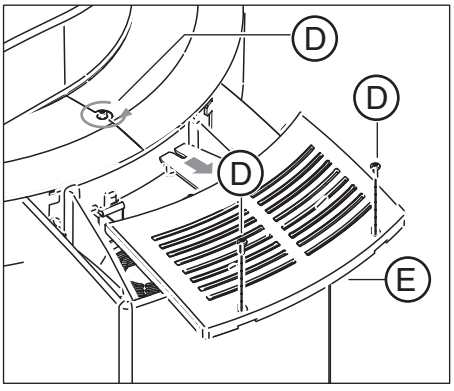
NOTICE

Damage to the measuring unit

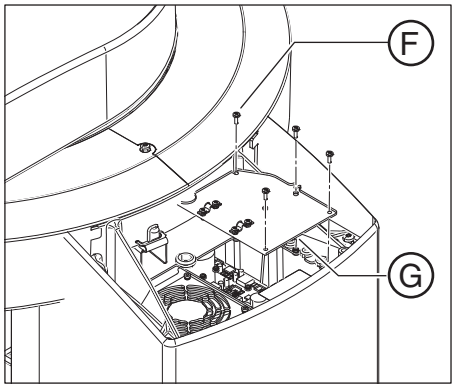
The ring assembly and the tube assembly move during the measurement.
Make sure that the measuring wires are sufficiently long to allow for the ring movement and that the measuring unit is in a secure position so that it will not fall down.

Preparing the measurement

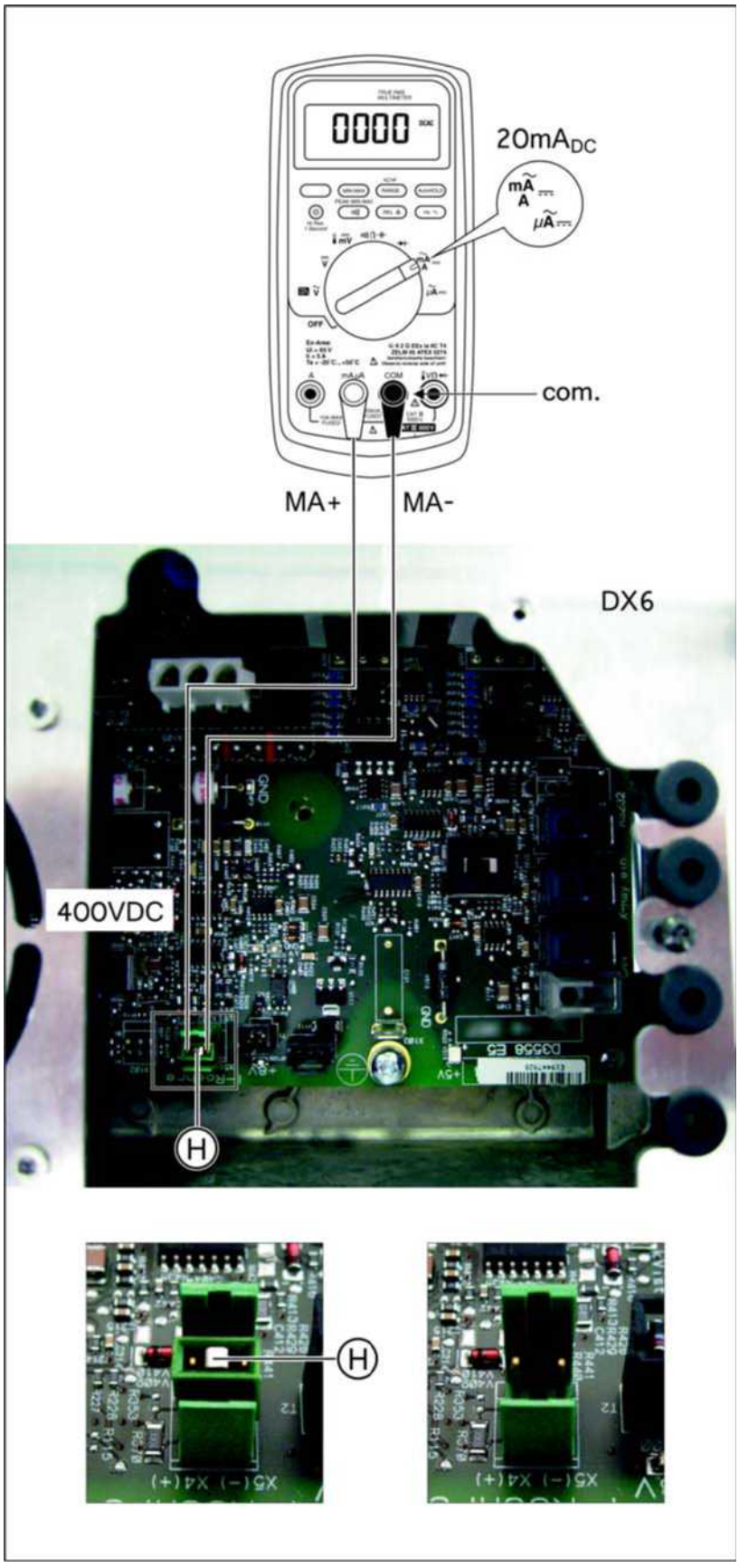
1. Switch off the unit (see Operating Instructions).
   DANGER! After switching off the unit, wait at least 4 minutes (LED V500 on the DX6 must no longer be on) before removing the cover on the tube assembly.



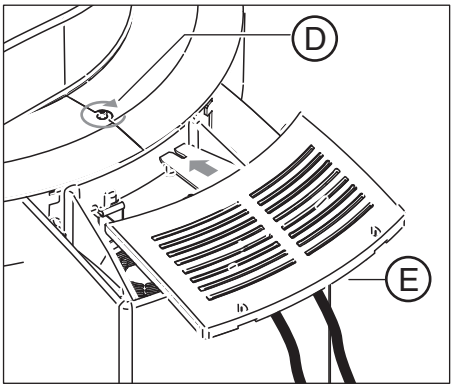
2. Loosen the 3 screws (**D**) and remove the lid of the tube assembly cover (**E**).



3. Loosen the 4 screws (**F**) and remove the cover plate (**G**).

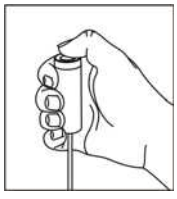

0000
20mA DC
com.
MA+
MA-
DX6
400VDC
H
H

4. **DANGER! After switching off the unit, wait at least 4 minutes (LED V500 on the DX6 must no longer be on) before removing jumper H from the DX6 board.**
   Remove the jumper (**H**) from connector **X302** on the **DX6** board.
5. **DANGER! Only use fully insulated measuring wires.**
   Connect the digital multimeter with the measuring wires to test points **MA-** (X5-) and **MA+** (X4+) at connector **X302** on the **DX6** board.
6. On the multimeter, select the **current measuring range 20 mA DC**.
7. **NOTICE! If the lid of the tube assembly cover is not attached, the ring circulation is impeded and the unit can be damaged.**
   Temporarily install the lid of the tube assembly cover (**E**) on the unit using the screw (**D**).
8. **DANGER! Do not touch any live components!**
   Set the main switch (**A**) to **I** (see also Operating Instructions).
9. Wait for approx. 1 minute.
10. Press the R key.
    ↳ The unit moves to its starting position.



Performing measurements

1. Call the Service menu and the Service routine **S002.5** (see Service Manual).
2. Select kV/mA level **85 kV/7 mA** and **4 seconds** of radiation time (see Service Manual).
3. **CAUTION! Activating the release button triggers X-rays.**
   Release the radiation. Hold the release button pressed until the set radiation time has expired.

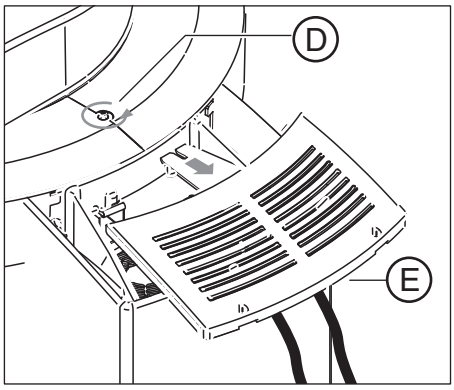


IMPORTANT
1 mA corresponds to a tube current of 1 mA. The permissible tolerance is ± 20 %.

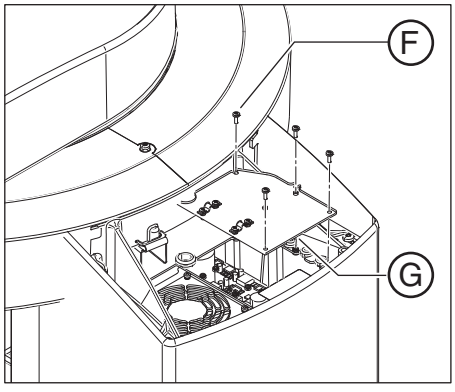
Analyzing measurements

➢ Read the voltage value on the display of the multimeter.
↳ The tube current must be in the range of **7mA ± 1.4mA**.
↳ If the measured value does *not* fall within the permissible tolerance, replace the *tube assembly* (see Service Manual).
↳ If the measured value falls within the permissible tolerance, conclude the measurement.

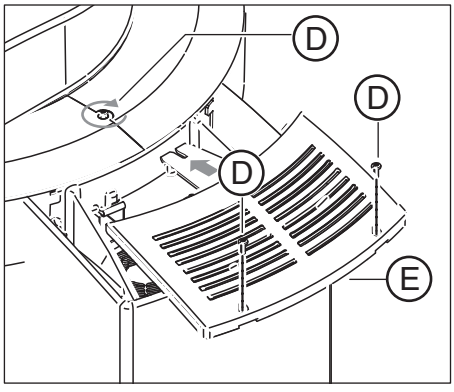
Concluding the measurement



1. Switch the unit on via switch (**A**) (see also Operating Instructions).
2. Loosen the screw (**D**) and remove the lid of the tube assembly cover (**E**).
3. **DANGER! After switching off the unit, wait at least 4 minutes before removing the measuring wires or reinserting the jumper!**
   Remove the measuring wires and bridge with the **test points MA+/ MA-** on the **DX6** board again with the jumper (**H**).



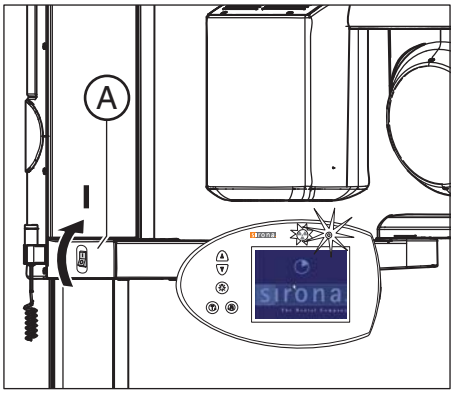
4. Reattach the cover plate (**G**) to the tube assembly with the 4 screws (**F**).



5. Reattach the lid of the tube assembly cover (**E**) to the unit and secure it with the 3 screws (**D**).

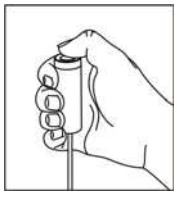
8 Checking the tube voltage

Preparing the measurement



1. Attach the Mult-O-Meter sensor in the middle of the X-ray detector.
2. Set the main switch (**A**) to **I** (see also Operating Instructions).
3. Wait for approx. 1 minute.
4. Press the R key.
   ↳ The unit moves to its starting position.

Performing measurements



1. Call the Service menu and the Service routine **S002.5** (see Service Manual).
2. Select kV/mA level **85 kV/7 mA** and **4 seconds** of radiation time (see Service Manual).
3. **CAUTION! Activating the release button triggers X-rays.**
   Release radiation. Hold the release button pressed until the set radiation time has expired.

Analyzing measurements

➢ Read the voltage values on the display of the Mult-O-Meter.

IMPORTANT
The measured tube voltage must correspond with the tube voltage set of 85 kV. The permissible tolerance is ± 10 %.

↳ If the measured values *do not fall within the permissible tolerance range*, replace the *tube assembly* (see Service Manual).

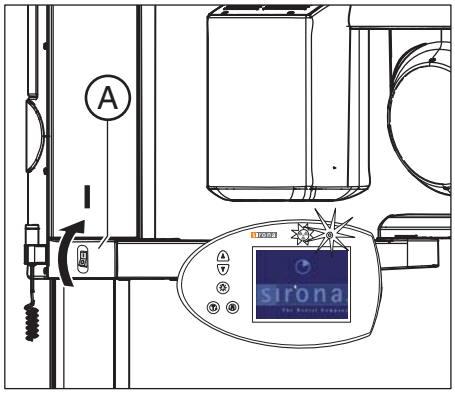
↳ If the measured values are within the permissible tolerance range, finalize the measurement.

Concluding the measurement

1. Exit the service routine.
2. Switch the unit on via switch (**A**) (see also Operating Instructions).

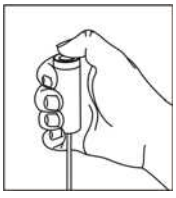
9 Checking the radiation time

Preparing the measurement



1. Attach the Mult-O-Meter sensor in the middle of the X-ray detector.
2. Set the main switch (**A**) to **I** (see also Operating Instructions).
3. Wait for approx. 1 minute.
4. Press the R key.
   ↳ The unit moves to its starting position.

Performing measurements



1. Call the Service menu and the Service routine **S002.5** (see Service Manual).
2. Select kV/mA level **85 kV/7 mA** and **4 seconds** of radiation time (see Service Manual).
3. **CAUTION! Activating the release button triggers X-rays.**
   Release radiation. Hold the release button pressed until the set radiation time has expired.

Analyzing measurements

➢ Read the radiation time on the Mult-O-Meter.

↳ The value displayed on the Mult-O-Meter for the radiation time must be **4 s**. The permissible tolerance is ± 10 %.

↳ If the measured radiation time does *not* fall within the permissible tolerance, replace the *tube assembly* (see Service Manual).

↳ If the measured radiation time falls within the permissible tolerance, finalize the measurement.

Concluding the measurement

1. Exit the service routine.
2. Switch the unit on via switch (**A**) (see also Operating Instructions).

10 Calculating / checking the mAs value

Calculate the mAs value with the following formula:

- mAs = mA measurement x time measurement
  = result of Checking the tube current [→ 13] x result of Checking the radiation time [→ 18]
  = 28 mAs ± 2.8 mAs

  The calculated value must be ± 10% at 28 mAs.

NOTICE

If the calculated value is not within the permitted tolerance, see the Service Manual.

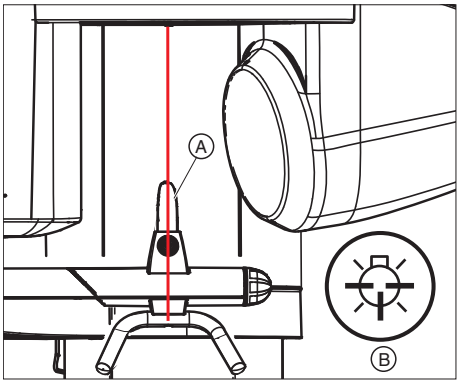
11 Checking the laser light localizers

⚠ CAUTION

Risk of injury to eyes.

The unit contains lasers of Class 1.
Keep a distance of at least 4" (10 cm) between eye and laser. Do not look into the laser beam.

Checking the vertical laser beam (MS)



1. Set the bite block (**A**) in the bite block holder, see Operating Instructions.
2. Press the light localizer key (**B**) on the control panel.
   - The light localizer is switched on.
   - The vertical laser beam must be displayed in the center of the bite block and the bite block holder. If this is not the case, adjust the laser light localizer, see Service Manual.
3. Switch the light localizers off.

12 Adjusting and calibrating the system

12.1 Calling the "Adjustment/Calibration" menu

You can call the *"Adjustment/calibration"* menu via SIDEXIS XG:

"Utilities" | *"Constancy test..."* | *"3D"*| *"Select X-ray device"* | *"Service exposure "* | *"Select X-ray component"* | *"Adjustment/calibration"* | Password prompt (see section entitled "Password protection")

The *"Select X-ray device"* and *"Select X-ray component"* prompts are only displayed if more than one unit has been set up in SIDEXIS XG.

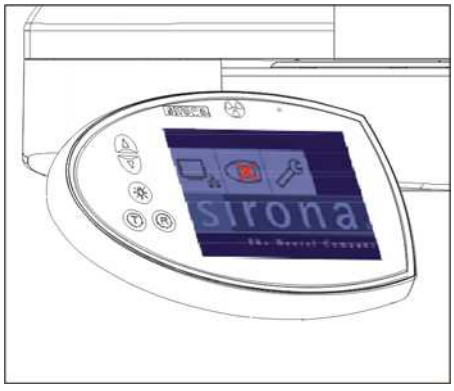
Password protection

The *"Adjustment/calibration"* menu is password-protected. For the password, enter the first four digits of the current system date (PC) in reverse order. Example: On 05/30/2010, the service password is 5003.

Service mode

When you open the *"Adjustment/calibration"* menu, the unit switches from user mode to the PC service mode logged by the PC. In PC service mode, the control options that are available on the control panel are determined by SIDEXIS XG and the service routine currently selected. General control of the unit by means of the control panel (as in the user mode) is not possible in this mode.

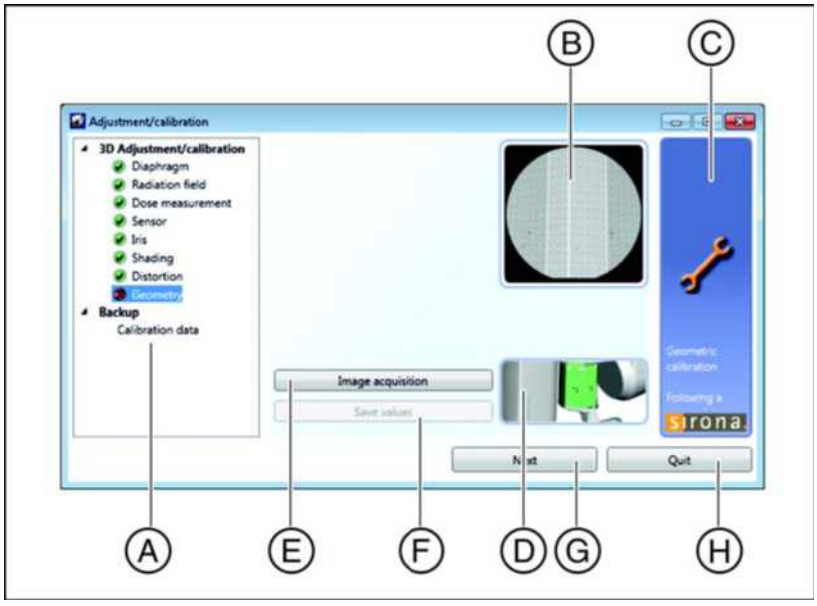
Easypad



Service mode is displayed on the Easypad via the PC service image.

12.2 Menu structure

The menu is divided into four areas.



A	Navigation area	Structure tree for adjustment and calibration [→ 23]
B	Preview image	Shows the exposure to be taken in this stage of the adjustment/calibration procedure.
C	Message window	Shows messages and information about this stage of the adjustment/ calibration procedure.
D	Tools pictograph	Shows which (if any) test phantom must be used for this stage of the adjustment/ calibration procedure.

In addition to the four areas, the menu also contains the following buttons:

E	Image acquisition	Makes the unit ready for exposure.
F	Save values	Saves the current adjustment/ calibration values.
G	Next	Switches to the next stage of the adjustment/calibration procedure.
H	Exit	Exits adjustment/calibration and closes the menu.

12.2.1 Navigation area

The navigation area contains a structure tree similar to the one you will be familiar with from your Windows interface. The structure tree contains all stages of the adjustment and calibration procedure you need to complete in order to adjust and calibrate your system. The order in which the elements appear in the structure tree determines the chronological order of the procedure to adjust and calibrate the unit:

- Diaphragm
- Radiation field
- Dose measurement
- Sensor
- Iris
- Shading
- Distortion
- Geometry

In addition to the elements required for adjustment and calibration of the unit described above, the structure tree also contains one other element:

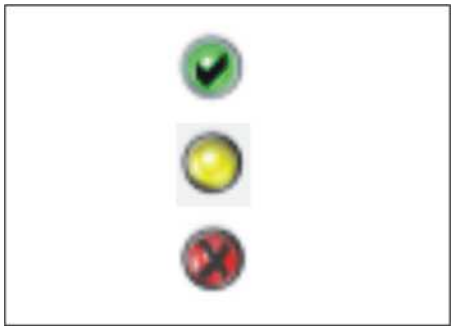
Backup

- Calibration data

Validity of existing adjustment/calibration settings

The elements of the structure tree used for adjusting (calibrating) the device are prefixed by symbols indicating the current status of the corresponding adjustment or calibration operation.

The element for saving calibration data does not contain any symbols.



Green and checked	Valid data record; adjustment/calibration is in progress	No adjustment/calibration required
Yellow	Data record available, but not yet saved	Data record must be saved
Red	Invalid data record or no record present	Adjustment/calibration required

Working with the structure tree

You can navigate between the elements of the structure tree by clicking on them with the mouse.
NOTICE! You must follow the prescribed sequence in order to obtain a valid adjustment or calibration.

Click with the mouse on the small triangles in front of the elements to collapse and expand the structure tree.

12.2.2 Tool pictographs

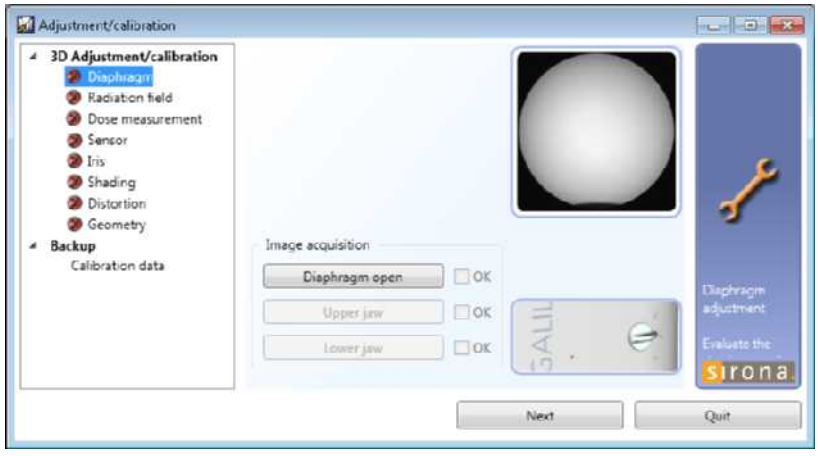
The tools pictograph shows which (if any) test phantom must be used for this particular calibration step.

Click *"Cancel"* to quit the *"Service functions"* menu.

12.3 Adjustment and calibration via the "Service Functions" menu

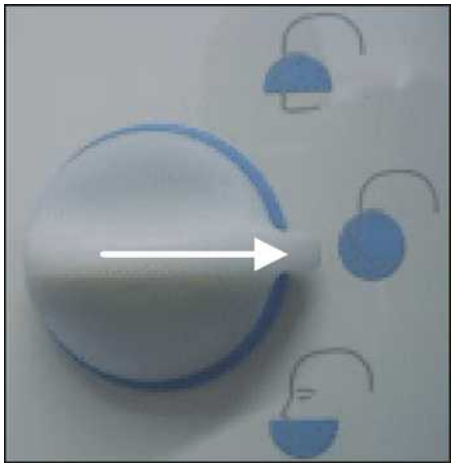
IMPORTANT
After every calibration of the unit, the reference values for the constancy measurement must be recalculated and entered in the "Test results" form, "Reference value" column.

12.3.1 Diaphragm image



1. Call the *"Adjustment/calibration"* menu [→ 21].
2. In the structure tree, under *"3D Adjustment/calibration"*, click on the *"Diaphragm"* element (S030.5).
   ↳ The *"Diaphragm"* menu is displayed in the action area.

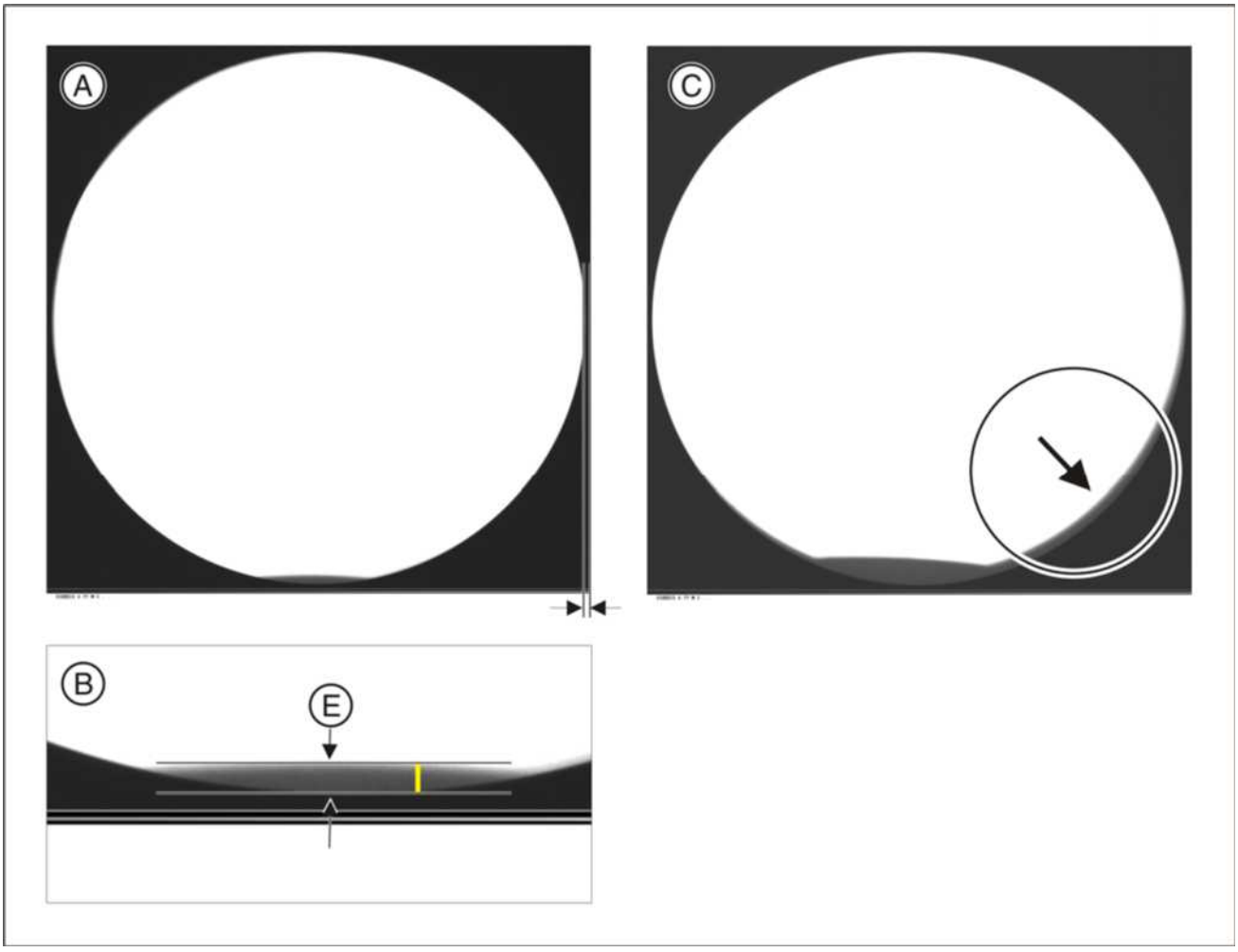
Adjusting the "diaphragm open" diaphragm setting



1. Set the rotary knob on the tube assembly to the "open diaphragm" position.

2. Click on the *"Diaphragm open"* button in the *"Image acquisition"* menu area.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S030.5 is displayed on the control panel.
3. Take an exposure.

4. For GALILEOS Comfort and GALILEOS Comfort^{PLUS}:
Evaluate the image.



A+B	Adjustment OK
C	Adjustment not OK
E	Permissible tolerance: 30 pixels ± 5 pixels

- The brightness distribution along the border surrounding the image on all sides must be uniform (**A**).
- The distance between the bottom edge and the lowest point in the image should be 30 ± 5 pixels (measure with SIDEXIS scale) (**B**).
  If the distance between the bottom edge and the lowest point in the image is out of tolerance (**E**) or the brightness distribution along the surrounding border is not uniform (**C**), the diaphragm must be adjusted mechanically.

5. If the exposure is OK (**A**+**B**), confirm this by clicking the check box located to the right of the *"Diaphragm open"* button.
   - The box will appear checked.
   - The adjustment for the "open diaphragm" diaphragm setting is now complete.
   - The *"Diaphragm open"* button is selectable in the *"Image acquisition"* menu area.
6. Continue the calibration procedure with the adjustment of the "upper jaw" diaphragm setting.

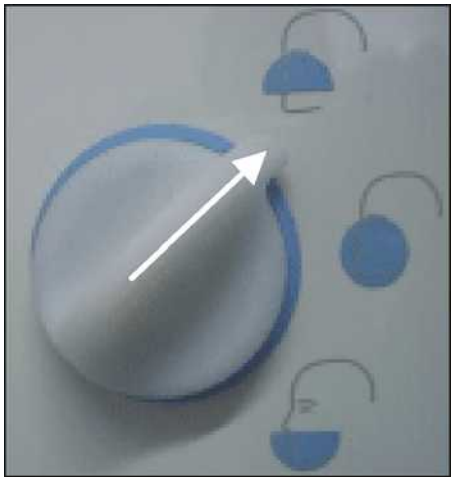
Adjustment of the "Upper jaw" diaphragm setting

✓ The *"Adjustment/calibration"* menu is called [→ 21].

✓ The element *"Diaphragm"* is selected under *"3D Adjustment/ calibration"* in the structure tree (S030.5).

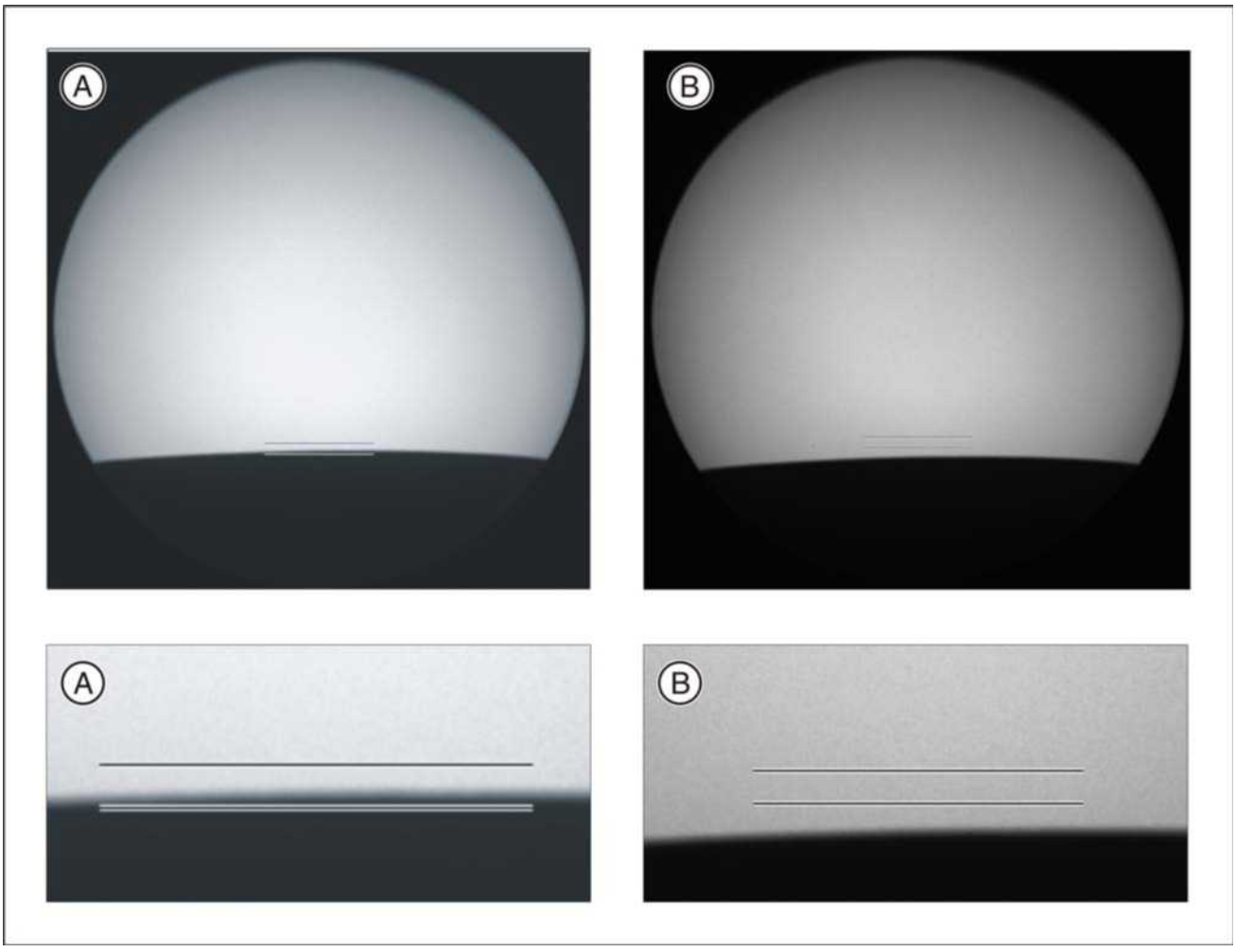
✓ The *"Upper jaw"* button is selectable in the *"Image acquisition"* menu area.

1. Click on the *"Upper jaw"* button in the *"Image acquisition"* menu area.
   - The *"Diaphragm"* menu is displayed in the action area.



2. Set the rotary knob on the tube assembly to the "maxillary exposure" position.
3. Click the *"Upper jaw"* button.
   - SIDEXIS XG makes the unit ready for exposure.
   - Service routine S030.5 is displayed on the control panel.
4. Take an exposure.

5. Evaluate the image.



A	Adjustment OK
B	Adjustment not OK

↳ The upper edge of the lower lead diaphragm must be within tolerance, i.e. lie inside of the auxiliary lies (**A**).
If the edge is out of tolerance (**B**), the diaphragm must be adjusted mechanically.

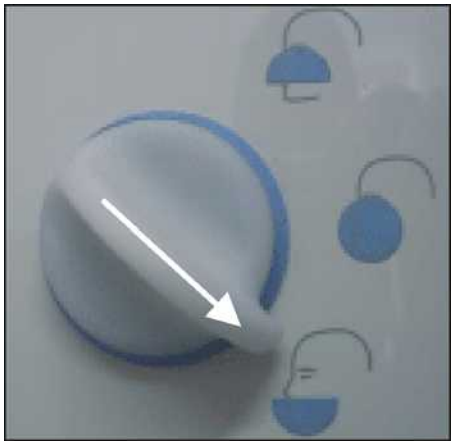
6. If the exposure is OK (**A**), confirm this by clicking the check box located to the right of the *"Upper jaw"* button.
   - The box will appear checked.
   - The adjustment for the "Upper jaw" diaphragm setting is now complete.
   - The *"Lower jaw"* button is selectable.
7. Continue the calibration procedure with the adjustment of the "Lower jaw" diaphragm setting.

Adjustment of the "Lower jaw" diaphragm setting

✓ The *"Adjustment/calibration"* menu is called [→ 21].

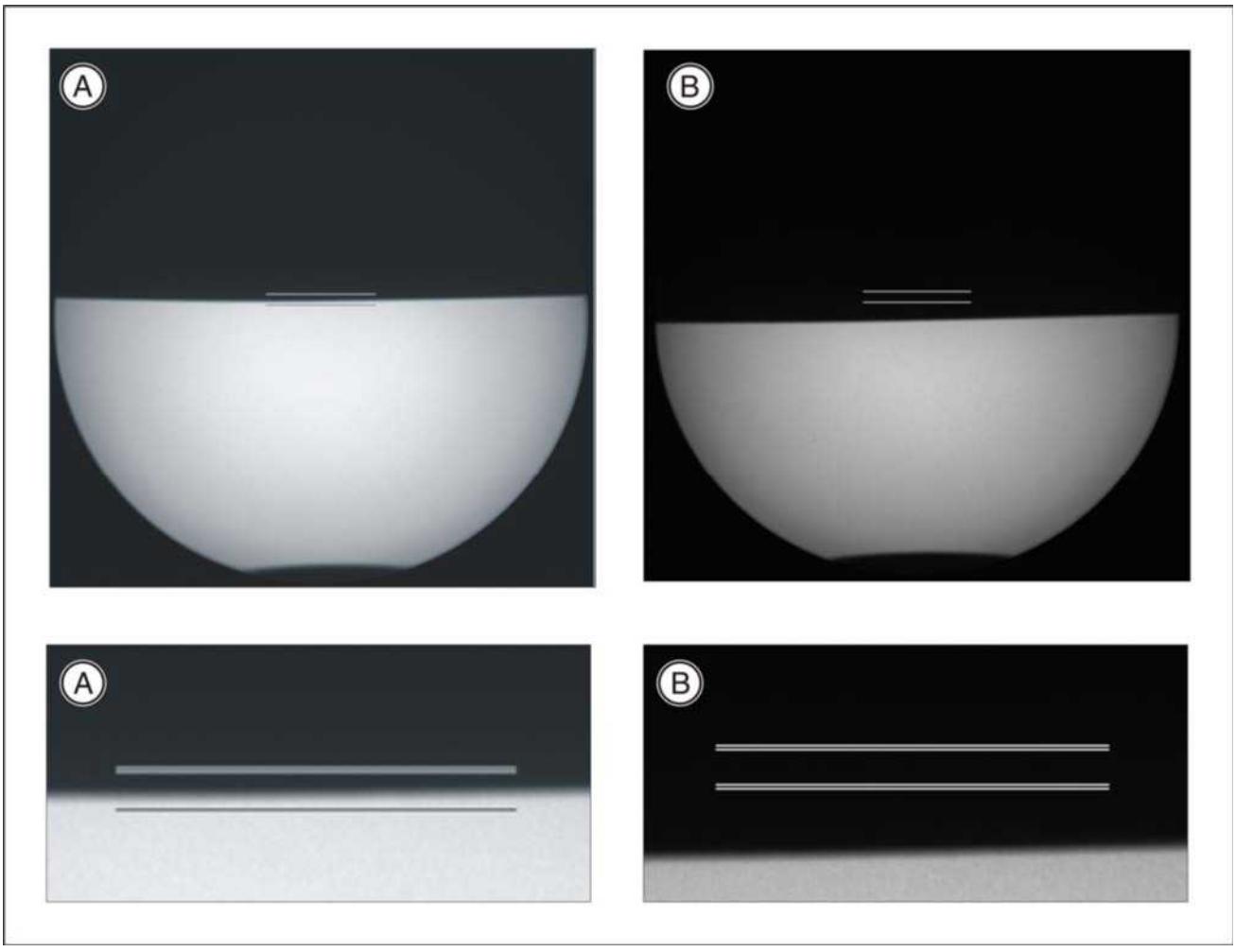
✓ The element *"Diaphragm"* is selected under *"3D Adjustment/ calibration"* in the structure tree (S030.5).

✓ The *"Lower jaw"* button is selectable in the *"Image acquisition"* menu area.



1. Set the rotary knob on the tube assembly to the "lower jaw" position.
2. Click the *"Lower jaw"* button.
   - SIDEXIS XG makes the unit ready for exposure.
   - Service routine S030.5 is displayed on the control panel.
3. Take an exposure.

4. Evaluate the image.



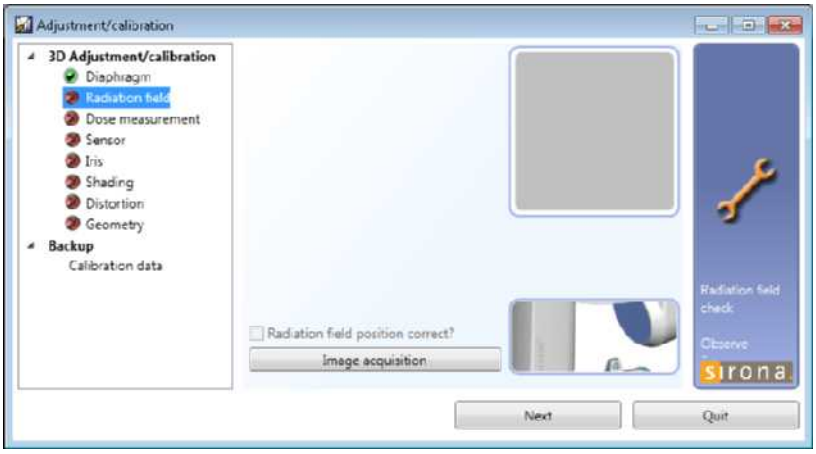
A	Adjustment OK
B	Adjustment not OK

↳ The lower edge of the upper lead diaphragm must be within tolerance, i.e. lie inside of the auxiliary lines (**A**).
If the edge is out of tolerance (**B**), the diaphragm must be adjusted mechanically.

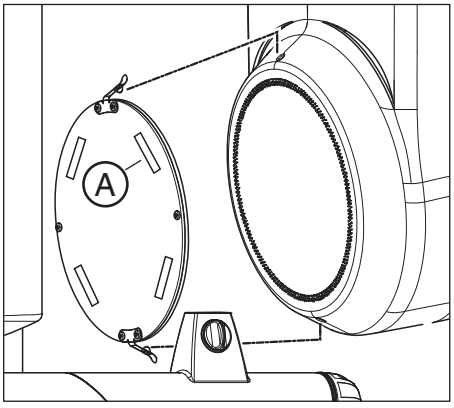
5. If the exposure is OK (**A**), confirm this by clicking the check box located to the right of the *"Lower jaw"* button.
   ↳ The box will appear checked.
   ↳ Diaphragm adjustment is now complete.
6. Continue the calibration procedure with the radiation field check [→ 31].

12.3.2 Checking the radiation field

IMPORTANT: The illumination must be checked once the collimator has been adjusted.



✓ The *"Adjustment/calibration"* menu is called [→ 21].

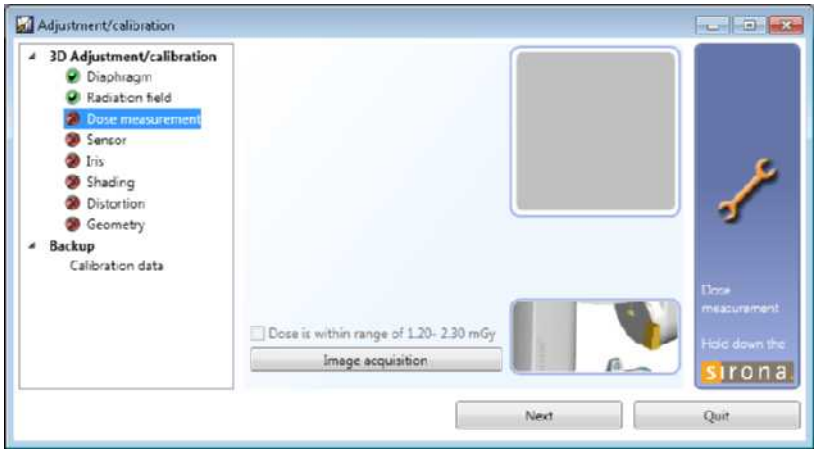


1. Clip the distortion phantom onto the X-ray detector cover.
2. In the structure tree, under *"3D Adjustment/calibration"*, click on the *"Radiation field"* element (S002.6).
   - ↳ The *"Radiation field"* menu is displayed in the action area.
3. Click the *"Image acquisition"* button.
   - ↳ SIDEXIS XG makes the unit ready for exposure.
   - ↳ Service routine S002.6 is displayed on the control panel.
4. Press the R key to move the unit back to the starting position.
5. Press the release button. Hold down the release button and observe the distortion phantom. The lighting strips on the distortion phantom (**A**) must not light up.
   If the strips on the phantom light up at all, the system is overexposed, and you cannot continue the adjustment. In this case, repeat the diaphragm adjustment procedure and then check the radiation beam field again. If the lighting strips still light up during the re-check of the beam field, contact the SIRONA Customer Service Center (CSC) to solve the problem.

6. To confirm that the lighting strips on the distortion phantom are *not* lit, click the check box on the left next to the text *"Radiation field position correct?"*.
   - ↳ The box will appear checked.
   - ↳ The beam field check is now completed.
7. Continue the calibration procedure with the dosimetry [→ 32].
   Tip: Leave the distortion phantom on the unit for the next calibration step.

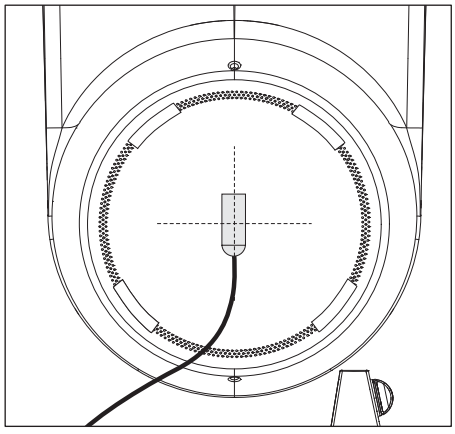
12.3.3 Dosimetry

A dosimeter for pulsed radiation (e.g. Mult-O-Meter 512L) is required for dosimetry.

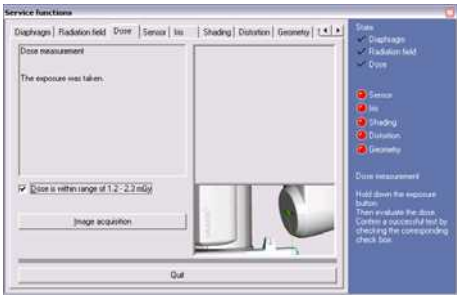


✓ The Adjustment/calibration menu is called [→ 21].

✓ The distortion phantom is clipped onto the cover of the X-ray detector for protection against scratching.

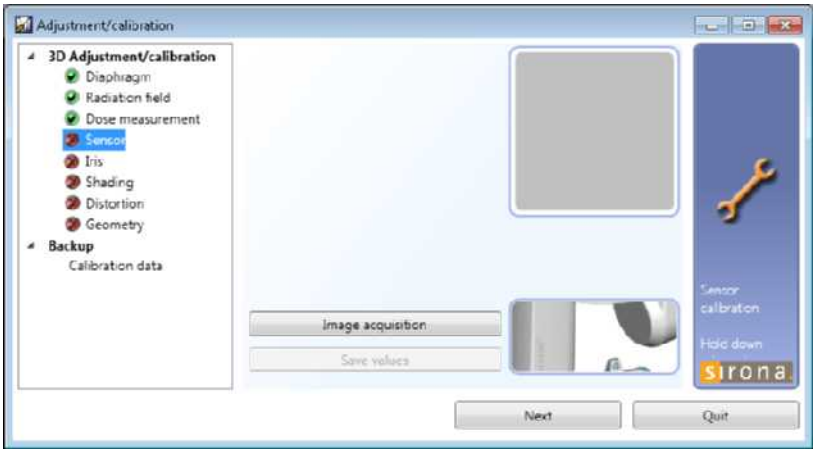


1. Attach the Mult-O-Meter sensor approximately in the middle of the distortion phantom mounted on the X-ray detector.
2. In the structure tree, under 3D Adjustment/calibration, click on the *"Dose measurement"* element (S002.6).
   ↳ The *"Dose measurement"* menu is displayed in the action area.
3. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S002.6 is displayed on the control panel.
4. Press the R key to move the unit back to the starting position.
5. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
6. Then read off the dose from the Mult-O-Meter.
   For GALILEOS Comfort^{PLUS}, the value must be between 2.3 and 4.5 mGray.
   If the value is outside the permissible range, check the X-ray tube assembly.



7. To confirm that the dose is within the *permissible range between 2.3 and 4.5 mGray*, click the check box on the left next to the text.
   ↳ The box will appear checked.
   ↳ The dosimetry is now complete.
8. Remove the sensor from the distortion phantom and take the phantom off the X-ray detector.
9. Continue the calibration procedure with the sensor adjustment [→ 33].

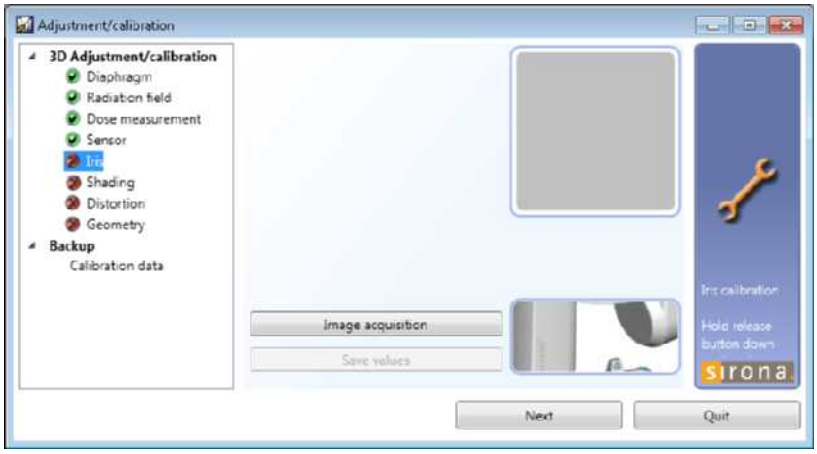
12.3.4 Sensor adjustment



✓ The Adjustment/calibration menu is called [→ 21].

1. In the structure tree under *"3D Adjustment/calibration"*, click on the *"Sensor"* element (S010.14).
   ↳ The *"Sensor"* menu is displayed in the action area.
2. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S010.14 is displayed on the control panel.
3. Press the R key to move the unit back to the starting position.
4. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
   IMPORTANT: This process takes approx. 2-3 minutes.
   ↳ The unit transfers the acquired images to the Reconstruction and Control Unit (RCU). This process can take 2-3 minutes. Once the transfer is complete, the evaluation of the sensor calibration is displayed in the message window.
   If the information in the message window indicates that calibration is *not OK and/or not possible*, keep repeating the procedure starting with Step b) until calibration is OK and/or possible.
   If you have repeated the procedure three times and still have not attained a positive result, please contact the SIRONA Customer Service Center (CSC).
5. If the adjustment is OK or possible, click the *"Save values"* button.
   ↳ The adjustment is saved.
   ↳ The sensor adjustment is now complete.
6. Continue the calibration procedure with the iris adjustment [→ 34].

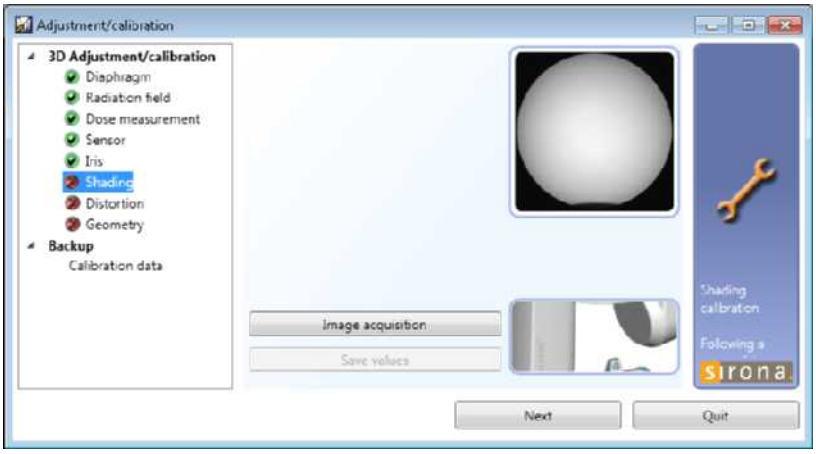
12.3.5 Iris adjustment



✓ The *"Adjustment/calibration"* menu is called [→ 21].

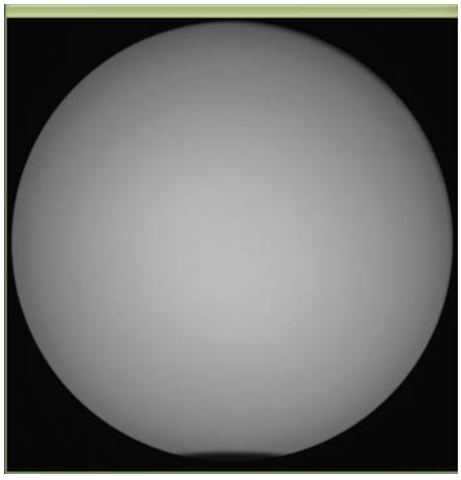
1. In the structure tree under *"3D Adjustment/calibration"*, click on the *"Iris"* element (S010.10).
   ↳ The *"Iris"* menu is displayed in the action area.
2. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S010.10 is displayed on the control panel.
3. Press the R key to move the unit back to the starting position.
4. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
   IMPORTANT: This process takes approx. 2-3 minutes.
   ↳ The unit transfers the acquired images to the Reconstruction and Control Unit (RCU). This process can take 2-3 minutes. Once the transfer is complete, the evaluation of the sensor calibration is displayed in the message window.
   If the information in the message window indicates that calibration is *not OK and/or not possible*, keep repeating the procedure starting with Step b) until calibration is OK and/or possible.
   If you have repeated the procedure three times and still have not attained a positive result, please contact the SIRONA Customer Service Center (CSC).
5. If the calibration is OK or possible, click the *"Save values"* button.
   ↳ The adjustment is saved.
   ↳ The iris adjustment is now complete.
6. Continue the calibration procedure with the shading calibration [→ 35].

12.3.6 Shading calibration



✓ The *"Adjustment/calibration"* menu is called [→ 21].

1. In the structure tree under *"3D Adjustment/calibration"*, click on the *"Shading"* element (S010.11 / S010.15).
   ↳ The *"Shading"* menu is displayed in the action area.
2. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S010.11 or S010.15 (extended shading calibration) is displayed on the control panel.
3. Press the R key to move the unit back to the starting position.
4. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
   ↳ The shading exposure and the evaluation of the shading calibration is displayed.
   If the information in the message window indicates that calibration is *not OK and/or not possible*, keep repeating the procedure starting with Step b) until calibration is OK and/or possible.
   If you have repeated the procedure three times and still have not attained a positive result, please contact the SIRONA Customer Service Center (CSC).
   IMPORTANT: No foreign bodies may be visible on the shading exposure. If this is the case, check the beam path for foreign bodies, remove them if necessary and repeat the calibration.



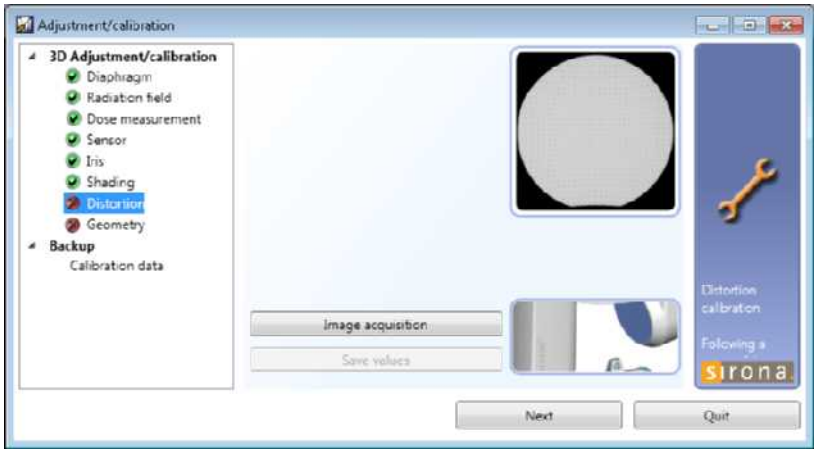
5. If the calibration is OK or possible, click the *"Save values"* button.
   ↳ The calibration is saved.
   ↳ The shading calibration is now complete.
6. Continue the calibration procedure with the distortion calibration [→ 36].

12.3.7 Distortion calibration

IMPORTANT

With GALILEOS Comfort^{PLUS}:

With GALILEOS Comfort^{Plus}, the distortion phantom delivered with the device must be used. Distortion phantoms with a serial number <3001 may not be used for the calibration of GALILEOS Comfort^{PLUS}.



✓ The *"Adjustment/calibration"* menu is called [→ 21].

1. In the structure tree under *"3D Adjustment/calibration"*, click on the *"Distortion"* element (S010.12).
   ↳ The *"Distortion"* menu is displayed in the action area.
2. Clip the distortion phantom onto the X-ray detector cover.
3. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S010.12 is displayed on the control panel.
4. Press the R key to move the unit back to the starting position.
5. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
   IMPORTANT: This process takes approx. 2-3 minutes.
   ↳ The unit transfers the acquired images to the Reconstruction and Control Unit (RCU). This process can take 2-3 minutes. Once the transfer is complete, the evaluation of the distortion calibration is displayed in the message window.
   If the information in the message window indicates that calibration was not successful, check the calibration phantom to make sure that it is not damaged.
   If the phantom checks out OK (all balls are present and correctly positioned), repeat the procedure starting with point d) as often as required until the calibration is OK.
   If you have repeated the procedure three times and still have not attained a positive result, please contact the SIRONA Customer Service Center (CSC).

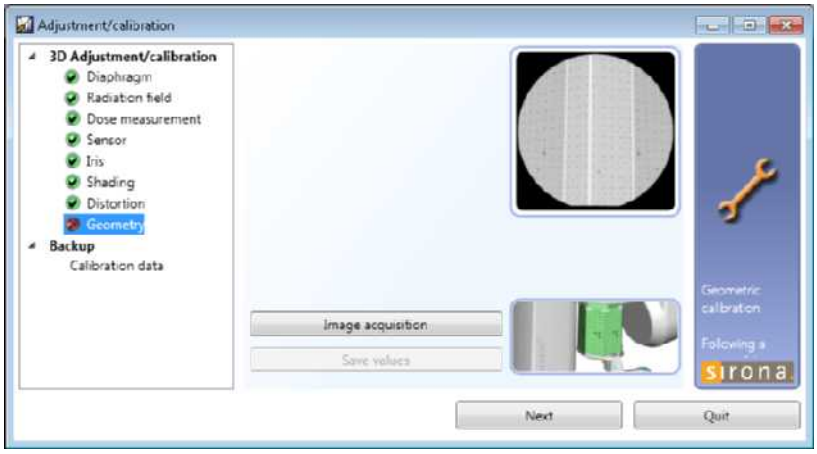
6. **IMPORTANT:** When a new distortion calibration is saved, the geometric calibration is set to "invalid" (red LEDs).
   If the calibration is OK or possible, click on the *"Save values"* button.
   - ↳ The calibration is saved.
   - ↳ The distortion calibration is now complete.
7. Remove the distortion phantom again from the X-ray detector cover.
8. Continue the calibration procedure with the geometry calibration [→ 38].

12.3.8 Geometry calibration

IMPORTANT

For an installed and configured FACESCAN:

The face scanner is automatically calibrated during the geometry calibration of GALILEOS. In this case, make sure that the normal room lighting is switched on during the calibration process. The room does not have to be darkened during calibration.



✓ The *"Adjustment/calibration"* menu is called [→ 21].

1. In the structure tree, under *"3D Adjustment/calibration"*, click on the *"Geometry"* element (S010.13).
   ↳ The *"Geometry"* menu is displayed in the action area.
2. Insert the geometric phantom in the bite block holder of the unit. Align the phantom with a spirit level.
3. For FACESCAN: Check to make sure that the room lighting is switched on. Switch it on if necessary.
4. Click the *"Image acquisition"* button.
   ↳ SIDEXIS XG makes the unit ready for exposure.
   ↳ Service routine S010.13 is displayed on the control panel.
5. Press the R key to move the unit back to the starting position.

6. Press the release button. Press and hold down the button until the exposure is complete, the preview image is displayed in the exposure window, and the acoustic signal indicating the end of the exposure (double beep) sounds (if it has been configured).
   IMPORTANT: This process takes approx. 2-3 minutes.
   - The unit transfers the acquired images to the Reconstruction and Control Unit (RCU). This process can take 2-3 minutes. Once the transfer is complete, the evaluation of the calibration is displayed in the message window.
     If the information in the message window indicates that calibration was not successful, check the calibration phantom to make sure that it is not damaged.
     If you have repeated the procedure three times and still have not attained a positive result, check the mechanical geometry of the unit. Adjust the unit if necessary and then repeat the calibration. If this still does not lead to a positive result, please contact the SIRONA Customer Service Center (CSC).
7. If the calibration is OK or possible, click the *"Save values"* button.
   - The calibration is saved.
   - Calibration of the geometry is now complete.
8. Remove the geometric phantom from the bite block holder of the unit.

Yearly maintenance checklist

sirona
The Dental Company

GALILEOS Comfort PLUS

Yearly Maintenance Checklist

Customer: _____ Address: _____

Dealer: _____ Address: _____

Date of original installation: _____ Date of inspection: _____

Report of Assembly FD 2579 # _____

SCHEDULE	Yes	No	Remarks
All manuals are present	☐	☐	
Test instruments as required	☐	☐	

	Manufacturer	Model	Accuracy	Last calibrated
Voltmeter				
mAmeter				
Dosemeter				

Any mechanical damage noticed	☐	☐	
All labels are present and legible	☐	☐	
All indicator lights are OK	☐	☐	
Radiation indicator **X-ray** lights up, audible buzzer OK	☐	☐	
Deadman feature OK	☐	☐	
Power supply adequate	☐	☐	Line voltage: . . . . . .V Voltage drop: V
kV – Verification is OK	☐	☐	
Tube current is within specified limits	☐	☐	Measurement: . . . . . mA
Specified exposure time OK	☐	☐	Measurement: . . . . .
Calculated mAs value is OK	☐	☐	
X-ray beam position OK	☐	☐	
The unit is in compliance with MFG specified tests and safety	☐	☐	

Technician: Dealer:

GALILEOS Comfort PLUS

Yearly Maintenance Checklist

Customer: _____ Address: _____

Dealer: _____ Address: _____

Date of original installation: _____ Date of inspection: _____

Report of Assembly FD 2579 # _____

SCHEDULE	Yes	No	Remarks
All manuals are present	☐	☐	
Test instruments as required	☐	☐	

	Manufacturer	Model	Accuracy	Last calibrated
Voltmeter				
mAmeter				
Dosemeter				

Any mechanical damage noticed	☐	☐	
All labels are present and legible	☐	☐	
All indicator lights are OK	☐	☐	
Radiation indicator **X-ray** lights up, audible buzzer OK	☐	☐	
Deadman feature OK	☐	☐	
Power supply adequate	☐	☐	Line voltage: . . . . . .V Voltage drop: V
kV – Verification is OK	☐	☐	
Tube current is within specified limits	☐	☐	Measurement: . . . . . mA
Specified exposure time OK	☐	☐	Measurement: . . . . .
Calculated mAs value is OK	☐	☐	
X-ray beam position OK	☐	☐	
The unit is in compliance with MFG specified tests and safety	☐	☐	

Technician: Dealer:

GALILEOS Comfort PLUS

Yearly Maintenance Checklist

Customer: _____ Address: _____

Dealer: _____ Address: _____

Date of original installation: _____ Date of inspection: _____

Report of Assembly FD 2579 # _____

SCHEDULE	Yes	No	Remarks
All manuals are present	☐	☐	
Test instruments as required	☐	☐	

	Manufacturer	Model	Accuracy	Last calibrated
Voltmeter				
mAmeter				
Dosemeter				

Any mechanical damage noticed	☐	☐	
All labels are present and legible	☐	☐	
All indicator lights are OK	☐	☐	
Radiation indicator **X-ray** lights up, audible buzzer OK	☐	☐	
Deadman feature OK	☐	☐	
Power supply adequate	☐	☐	Line voltage: . . . . . .V Voltage drop: V
kV – Verification is OK	☐	☐	
Tube current is within specified limits	☐	☐	Measurement: . . . . . mA
Specified exposure time OK	☐	☐	Measurement: . . . . .
Calculated mAs value is OK	☐	☐	
X-ray beam position OK	☐	☐	
The unit is in compliance with MFG specified tests and safety	☐	☐	

Technician: Dealer:

GALILEOS Comfort PLUS

Yearly Maintenance Checklist

Customer: _____ Address: _____

Dealer: _____ Address: _____

Date of original installation: _____ Date of inspection: _____

Report of Assembly FD 2579 # _____

SCHEDULE	Yes	No	Remarks
All manuals are present	☐	☐	
Test instruments as required	☐	☐	

	Manufacturer	Model	Accuracy	Last calibrated
Voltmeter				
mAmeter				
Dosemeter				

Any mechanical damage noticed	☐	☐	
All labels are present and legible	☐	☐	
All indicator lights are OK	☐	☐	
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Technician: Dealer:

sirona
The Dental Company

GALILEOS Comfort PLUS

Yearly Maintenance Checklist

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GALILEOS Comfort PLUS

Yearly Maintenance Checklist

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The unit is in compliance with MFG specified tests and safety	☐	☐	

Technician: Dealer:

We reserve the right to make any alterations which may be required due to technical improvements.

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